

Daily GLOWBUGS

Digest: V1 #4

via AB4EL Web Digests @ SunSITE

Purpose: building and operating vacuum tube-based QRP rigs

[AB4EL Ham Radio Homepage @ SunSITE](http://www.amsat.org/~ab4el/)

%%%%% GlowBugs %%%% GlowBugs %%%% GlowBugs %%%% GlowBugs %%%%

Subject: glowbugs v1 #4
glowbugs **Friday, April 11 1997**

Volume 01 : Number 004

Date: Thu, 10 Apr 1997 13:07:44 -0400
From: BEN NOCK <106312.1035@compuserve.com>
Subject: Hello all from the UK.

Hi, Ben here, one or two off the BA list may have seen my postings.

Main interest is military stuff, and old stuff at that, so nearly all the sets here are valved. Around 320 at the moment, earliest is probably early 30's, lots of WWII stuff, and a few 50's, 60's and 70's sets, but they start loosing their attraction after the 50's, hi.

In the UK there is a group called Military Wireless Amateur Radio Soc, we have a net on Sat at 9.30am UTC, 3625Khz am, and Sundays, 9.30am UTC 3577Khz cw.

I have just been playing with a Lafy Starflite 390 ?? This has a 6146 in the pa but I have been having trouble getting a decent amount of o/p on am. I get about 20 watt which peaks up to about 40 on speech. Though the set is xtal controlled, I fed the low power o/p from the FT101E into the xtal socket, using the 101 as a vfo and receiver. On cw I get 50 watt out of the thing.

Anyone know this set, and can offer advise etc. Is this all I can expect to get out of it ?

cheers all. Ben G4BXD.

BEN NOCK, G4BXD, MILITARY WIRELESS IN THE MIDLANDS
MEMBER MILITARY WIRELESS AMATEUR RADIO SOCIETY,
MEMBER DUXFORD RADIO SOCIETY
MEMBER SURPLUS RADIO SOCIETY, RSGB, UKRS, MVT, 39/45 GROUP
MILITARY VALVE & VINTAGE COLUMN - PRACTICAL WIRELESS,
CONTRIBUTOR TO SWM, HRT, CQ & MV MAG

PACKET: G4BXD @ GB7TCM.#24.GBR.EU
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"REAL RADIO GLOWS IN THE DARK"

Date: Thu, 10 Apr 1997 13:07:40 -0400
From: BEN NOCK <106312.1035@compuserve.com>
Subject: QY3-65 valve ?? info wanted

I have just picked up a commercial bit
of kit which looks like a high power 2 Mtr (VHF)
amp.

It uses a pair of QY3-65 valves, with a great big
copper tubing coil, about 6 turn at 2.5 inch dia, with a neat
screw arrangement that slides copper tubes in and out of
the coil to obviously tune it.

Any idea of the power rating at vhf of these valves ?

Ben G4BXD.

Date: Thu, 10 Apr 97 12:13:28 CDT
From: sinned@VNET.IBM.COM
Subject: 7050 BA/GB QRG at 0100Z

Anchorbugs & Glowites

I've had reasonably good QSO's this week on 7050+/- all this week,
beginning around 0000/0100Z.

The Spanish SSB QRM sounds intimidating when you first tune over there,
but somehow the CW seems to come through anyway. The QRM level drops
as it gets later. Last night by 0300 there was a "clear channel" on
7050 Dallas-to-Columbus,OH. QSO'd with K8NU till our XYL's pulled us
away.

I was running the P-P 24G's at 50W out and Carl was running a 32V2
(or 32V3 maybe). Can't say if we chased away the SSB QRM or propagation
changed or the solar flare did something, or maybe the SSB folks
went to bed.

Anyway, it might be worthwhile to start a bit earlier. I just can't
keep this tired old body going late enough for 0400Z BA/GB QRG/QSO's.

BTW: QUESTION for propagation experts. What can we expect from this
highly hyped solar flare? I listened to 40 this morning and it sounded
about the same as any other morning? My minuscule expertise with
propagation would suggest more noise on lower bands, with higher bands
(ie 10M & 15M) comming alive. Any other opinions/predictions??

73's & C U on 7050+/-

Dennis W5FRS

Date: Thu, 10 Apr 1997 21:57:03 -0500
From: Kevin Pease <KPease@worldnet.att.net>
Subject: Re: Glowbug Rigs

Well I have been working on my version of a glowbug rig. I was initially going to build a regenerative superhet receiver but I have since changed my mind a bit. I am now building a simple dual conversion superhet receiver with a 1700 KHZ first IF and an 85 KHZ second IF using IF transformers from an old command set. I will have 1 stage of IF amplification with two IF transformers on the input side and 2 IF transformers on the output. It will use a product detector for CW only.

I am using a 6at6 and 6aq5 for the audio and a 6u8 and 6ber for mixers I will use a 6ba6 for the IF amp. I am looking at using a two diode product detector.

I have found at local electronics store some triad transformers and chokes for the power supply.

I am using a 6 henry choke with 33 uf on the input and 33 uf on the output of the choke. I may go to more capacitance if needed.

I also have some .6 .7 and 1 henry chokes. Does anyone know what those would be useable for ?

I also obtained many vertical output transformers with ratios from 6:1 to 18:1. Are those useable for audio interstage or maybe modulations transformers in low power rigs ?

For the transmitter section I am going to use a 6bm8 oscillator/PA.

This will be a complete glowbug station in one box for 80 and 40 meters.

I have started construction of the power supply first and will proceed to the audio stages then the IF/product detector stages. that way I can test things out as I proceed.

I will wire the filament circuits with twisted pairs and use a pot to ground to balance the filaments to hopefully eliminate HUM in this rig.

With the choke in the power supply I hope that This rig will be hum free.

You help and comments are welcome and appreciated.

If anyone can use some of the vertical output transformers let me know and I can send a list of the ratios that I have.

Kevin Pease
WB0JZG

Date: Thu, 10 Apr 1997 13:18:53 -1000
From: "Peter L. Demmer" <ampruss@hits.net>
Subject: Re: 228 and growing...

Greetings to the GBL from Peter, KH6CTQ in the land of eternal summer; I am a 64 year elder male off spring of a first generation, Prussian father and a French mother. As a 6/12 year old, during my xtal set and regenny (with out the RF amp) days, I drove them both, (along with my neighbors in NSP Minnesota) around the proverbial snow covered bend. Some 24 years ago, I retired (after 22 years) from the US Naval submarine service. I quilified and served in both Diesel and nuclear boats as a motor-mac. Later designated as a machinest mate (chief) as in marine steam, diesel and the final 11 years in nuclear propulsion engineering. A collector, I am not. If it isn't CW then, well what the heck, thats ok too. I design and build for the pure pleasure and experience of developing and expressing my God given skills. During the most recent 26 years, some times, on ocassion, I have even turnd and earnd a coin or two of the relm. I have been there and have done/did/ and do a lot of that vacuum tube, solid state, IC, electro-mechanical, electro-pnumatic and all the other good radio and electronics stuff. But no, I didn't stick around for all the "T" shirts. My hb cubical quad, 4 el,4 bnd antenna makes my QRP/QRO message detectable on any rcvr, even those beloved gennys that are still alive and well in the US of A, Europe and Africa. Some 5 years ago, after a successful 40 year marriage, I was widowed. Three years later, I met a darned fine lady in a simular situation. So Im presently working on the 2nd year of this new marriage. In Hawaii this is called risk-um. Hey gang, our first real date was for her to sit with the phone close at hand on the back lanai (pourch). I expla ined her assignment. She is a nurse and as such, she was to call 911 for a body bag in case I fell off the tower. Seriously, I think I almost lost her there. She said that was not funny. So I showed her my safty belt. For her birthday, I gave her an extended audio tape of "The rythum of the code". It's her GTW music. Patricia Marie, sits it down in my shop, close at hand doing cross stitching stuff while I do glow bug stuff. Hey gang, its a start. Aloha Peter & Pat.

Date: Thu, 10 Apr 1997 16:17:16 -1000
From: "Peter L. Demmer" <ampruss@hits.net>
Subject: Re: Cathode Modulation

Eric;
Right on, you can also find this cathode modulator ckt in the RH for 1967. See pg. 295. Gud stuff for 6146s es 807s 1625 etc... Peter KH6CTQ

Date: Fri, 11 Apr 1997 08:38:07 +0000
From: "Brian Carling (Radio G3XLQ / AF4K)" <bry@mnsinc.com>
Subject: Re: Cathode Modulation

On 10 Apr 97 at 9:26, EWoodman@aol.com spoke about Re: Cathode Modulation and said:
> there's also a circuit using

> three of four transistors driving a big ole power transistor that
> goes in series with the cathode. Supposedly for cathode keyed rigs
> you just plug it into the key jack..

Sounds neat - you could use that OR the parallel 6L6s to do double
duty as -

- 1) A cathode modulator and
- 2) As a CW keying circuit!

I understand that there are limitations with cathode mod. though...

*** 73 from Radio AF4K / G3XLQ in Gaithersburg, MD USA *
** E-mail to: bry@mnsinc.com *
*** See the great ham radio resources at: *
** <http://www.mnsinc.com/bry/> *

Date: Fri, 11 Apr 1997 08:38:07 +0000
From: "Brian Carling (Radio G3XLQ / AF4K)" <bry@mnsinc.com>
Subject: Re: Anyone getting anything on the BA/GB QRG?

On 10 Apr 97 at 13:38, rdkeys@csemail.cropsci.ncsu.edu spoke about
Anyone getting anything on the BA/G and said:

> Anyone getting any QSO's on the BA/GB QRG's lately. I have heard a
> few and worked a few, but the traffic has been slow. I am sure it
> is the wonderful spring springing forthe, right?

We are all slogging away at 1040 forms just now, BA Bob!!

Cheers - Bry

*** 73 from Radio AF4K / G3XLQ in Gaithersburg, MD USA *
** E-mail to: bry@mnsinc.com *
*** See the great ham radio resources at: *
** <http://www.mnsinc.com/bry/> *

Date: Fri, 11 Apr 1997 10:49:19 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: Glowbug Rigs

> I also have some .6 .7 and 1 henry chokes. Does anyone know what those
> would be useable for ?

These would make great key thump filters with anywhere from 1 to 20 ufd
or so with them. I like the 1 h chokes on Grandma Hartley and Henrietta
Hartley to soften the keying a bit. Works great!

73/ZUT DE NA4G/Bob UP

Date: Fri, 11 Apr 1997 15:06:50 +0000
From: Sandy W5TVW <ebjr@worldnet.att.net>
Subject: Re: Anyone getting anything on the BA/GB QRG?

At 08:38 AM 4/11/97 +0000, you wrote:
>On 10 Apr 97 at 13:38, rdkeys@csemail.cropsci.ncsu.e spoke about
>Anyone getting anything on the BA/G and said:
>
>> Anyone getting any QSO's on the BA/GB QRG's lately. I have heard a
>> few and worked a few, but the traffic has been slow. I am sure it
>> is the wonderful spring springing forthe, right?
>
>We are all slogging away at 1040 forms just now, BA Bob!!
>
>Cheers - Bry
>
Activity last night on 7050 at 0100 and 0300Z. W5FRS, K9TR, W5TVW, WS4S
amung probably others.
Also worked WS4S on 10.110 at about 2200Z with the sand state 5 watt
rig in the back yard on a 15' whip.
80 meters monitored, but getting extremely noisy.

73,
E. V. Sandy Blaize, W5TVW
"Boat Anchors collected, restored, repaired, traded and used!"
417 Ridgewood Drive,
Metairie, LA., 70001
ebjr@worldnet.att.net
Looking for: 860 tubes, WL-460 tubes
Butternut HF2V antenna, G-R test gear.....*

Date: Fri, 11 Apr 1997 10:09:48 -0500 (CDT)
From: mjsilva@ix.netcom.com (michael silva)
Subject: Re: Heising modulation (was Re: AM Modulators, etc)

John wrote:

>Mike wrote:
>>It worked well enough, from what I understand -- capable of 100%
>>modulation. Somewhere I've got a design example for spec'ing the
>>modulation choke for a BCB transmitter, so the quality must have been
>>high enough for that application. The biggest problem is that the
>>audio amplifier, running class A, has to dissipate about five times
>>the power that the PA dissipates.

>Hi, Mike:
>Heising was not used for any broadcast transmitter that I know of in
>the last 60 years or so.

You could be right. I found a few schematics of broadcast
transmitters that used Heising, but they were '20s to early '30s. One
was the KDKA transmitter (1926), and two others were RCA jobs, from
Nilson and Hornung's "Practical Radio Communications" (1935). The KDKA
and one of the RCAs were "pure" Heising with parallel modulators, while
the other RCA did use a separate modulation transformer with P-P

modulators.

> The modulation choke in a BC transmitter is used so
>that the modulation transformer will have no DC in the secondary; the
>mod transformer output is capacitively coupled to one end of the mod
>choke (other end to B+) which then is connected to the PA.

Interesting. Common sense (danger! danger!) tells me that the size and cost of a separate modulation transformer and modulation choke will be greater than combining the two into a larger transformer. Was this two-iron approach really a common practice? Can any transformer-design wizards comment?

>
>Heising can be very good and sound great, but you cannot get 100%
>modulation without using the tapped choke routine. Using an ordinary
>choke will let you get, as a practical matter, something around 85% or
>so at the most.

Yep, that fits in with the numbers I found for using the PA voltage-dropping resistor -- it was recommended to drop 15-20% of the PA voltage across the resistor. Sure makes me appreciate the efficiency of standard/latter-day plate modulation!

73,
Mike, KK6GM

Date: Fri, 11 Apr 97 11:34:34 CDT
From: sinned@VNET.IBM.COM
Subject: Heath Warrior for sale

Someone looking for a heavy duty, reliable linear amp, 80-10M, should consider this. It has 3B28 rectifiers and 4-811's paralleled. The DC power capacitors are oil filled, rather than electrolytic. 811's are forced air cooled. The tubes are American made vintage and will probably outlast many of us, but in the event of wearout, replacement cost is trivial compared to other tube types. Power output is conservatively rated at 1000 Peak-SSB/CW and 400 AM, continuous duty.

Comsetically this is a 9 in my opinion, maybe better. Price is \$250 with original manual. It can be viewed at my QTH in Irving, Texas (near Dallas) and if you want to test it fully, bring your 1-KW dummy load and wattmeter. (I can only test it to 300W out myself) Also, can bring it to the Belton hamfest, but I won't have a table, etc.

I am handling this for an elderly ham friend who is retiring from HF activity. Also available is an HT-37, and an HW-100.

Dennis W5FRS
sinned@vnet.ibm.com

Date: Fri, 11 Apr 1997 11:44:09 -0500 (EST)
From: "Roberta J. Barmore" <rbarmore@indy.net>

Subject: Re: Heising modulation and those chokes in AM/BC rigs

Hi!

Going to start with a concept or two, the first one being high-falutin' and the second one a bit easier to take:

A) An AM transmitter is a two-quadrant multiplier; think of it as a big voltage-controlled amplifier or what the audio folks call a "gain cell."

B) When we plate-modulate, what we're trying to do is superimpose an AC waveform on the DC supply to the plate of the modulated stage. We have to pick our levels such that the *sum* of modulation & plate DC varies from 0 to 2x the DC level. Every plate-modulation scheme does this.

(Including pulse-width AM modulators, though they cheat in an interesting manner to accomplish it).

Okay, that's out of the way.

Now then, hitting 100% with Heising modulation can likely be done nicely with a pair of chokes as Chip Ownes suggests; the two chokes will keep the AC where it belongs and allow greater effective swing than using just one.

But there's a simpler way: between where the modulator plate and choke connect and the feed to plate of the RF amp, add a resistor bypassed by a substantial condenser. This drops the DC a bit, while allowing the AC to zip right by. (The problem with single-choke Heising is that the mod tube can't quite swing plate volts to down zero, and this takes care of that). It takes some cut-and-try, starting with a good guess, but it's not rocket science.

...Thought I wrote of this next subtopic, but maybe I didn't, or wasn't clear enough when I did:

The use of "modulation" chokes in AM/BC rigs was *very* common. They *did* have a modulation transformer, but one side of the secondary was grounded and the other side condenser-coupled to the side of the modulation choke that connected to the plate feed to the RF amp. Far side of the choke went to B+.

Why? *Core* *saturation.* Primary of the mod transformer was hooked to a P-P stage (99.44% of the rigs), so the DC in it, CT to each end, had a net magnetizing effect of about zilch. But if the (nearly always single-ended) RF amp plate supply ran through the secondary, the core would've been constantly magnetized by a healthy amount. That's not a good thing--eventually you "run out of room" to magnetize the core any further. You *can* fix it by using an even bigger transformer, but it's simpler and easier to add a choke instead--also a lot nicer to unload two 400# objects than one 1000# object when installing the transmitter! This approach allows each piece to be optimized for its job--the transformer for good fidelity and the choke for high impedance over the AF spectrum.

It works, too--a well-designed old 5kW AM/BC rig has good response down to 20cps or so. Other effects, inverse feedback and choice of coupling caps/transformers in the modulator, can make the LF square-wave response less than ideal--lotta tilt--but in nearly all cases, the modulation transformer/condenser/choke circuit is *not* the source of problems.

The other nice effect of this scheme is you're not as likely to have the modulator plate and RF amp plate supplies getting all cozy due to transformer breakdown; what usually dies due to transients is the modulation choke, far cheaper to replace. As the typical failure mode is a short to core, I've seen stations run 'em standing on a dozen shorty Coke bottles while awaiting a replacement--not a safe thing but it works.

73,
--Bobbi

Date: Fri, 11 Apr 1997 11:59:48 -0500 (CDT)
From: linscot@is.rice.edu (Steve Linscott)
Subject: Amplitude Modulation

Has any one attempted to build an amateur version of the PWM technique that modern AM broadcast xmtrs use? A few years ago, one of our local stations (KTRH) replaced their '30's vintage RCA 50KW rig with a Harris 50KW unit. I wrote to the guy at Harris who designed it, and he sent copies of the paper he wrote on it.

Basically, it puts a switch tube in series with the final tube, and runs with twice the normal plate voltage across the pair. The switch is pulse-width modulated: when it's full on, you have 200% voltage on the final, and when it is off, you have 0 volts. Hey, that sounds like 100% modulation! I believe it's called Class D modulation, and the efficiency is fantastic. The KTRH xmtr runs 55KW in, and 50KW out!

I have thought about building a rig with a couple of 6146's in series, with 1000-1200 volts across the pair. The pulse-width modulator that drives the switch tube is sand-based, and would have to be hidden in a "black box", so the tubes wouldn't see it and get upset! :-)

If anyone is interested, I'll dig up the paper on it, and maybe someone can scan it and put it in the archive.

73 de W5EGP

- Steve -

* Steve Linscott Divisional Consultant Natural Sciences *
* Rice University 6100 South Main Street Houston, Texas 77005-1892 *
* Phone: (713) 527-4985 FAX: (713) 527-6099 Email: linscot@rice.edu *

Date: Fri, 11 Apr 1997 15:15:59 -0400 (EDT)
From: EWoodman@aol.com
Subject: Determining Choke Values

I have several large power supply type chokes I've collected over the years. Problem is that I have no idea what the inductance values are. Is there any way to determine that without elaborate test gear?

Eric KA1YRV

End of glowbugs v1 #4

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Created by **Steve Modena, AB4EL**
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